Emaux
water technology

NT-MPUV Disinfection System

Instructions for Operating and Maintaining

EMUV18091243

Instructions

Instructions of symbols and graphic symbols applied in the manual are as followed:

Attention:
Certain actions and procedures are prohibited.

Warning/Instruction:
Warning of danger. General warnings of things need to be specially pay attention to. Important instructions of things that must be implemented.

Warning:
Voltage or High Voltage: Dangerous to people or family pets. Applicable regulations and accident prevention measures should be abide by.

Warning:
Dangerous situation. Serious injures or death may be caused. Products or surrounding environment may be damaged.

Information:
Information and instructions that should be abide by at the same time.

Important:
Measures proposed by EMAUX Company.

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1.0-Introduction

This manual is applicable to NT-MPUV Series medium pressure ultraviolet equipment manufactured by EMAUX Company.
This manual is applicable to NT-MPUV Series medium pressure ultraviolet equipment manufactured by EMAUX Company.
Ensure that before the using of this equipment, all relevant staff has carefully studied this operating specification, so that the safety use of ultraviolet equipment can be ensured. Operating specification is a composition of supplied equipment.Before running, all conditions required by safety operation should all be reached. Please refer to Section 3 "Safety Measures and Regulations".Only qualified personnel can do the installation, test running and maintaining of the equipment.The equipment should be operated by authorized personnel who have received relevant trainings. Any change to the equipment is prohibited before consulting the company, because it may affect the safety running of the equipment. The company is not responsible for the damages of the equipment caused by unapproved changes.

A

Indication:
Operating specification should be kept in a place which is convenient for operators and maintainers to fetch.

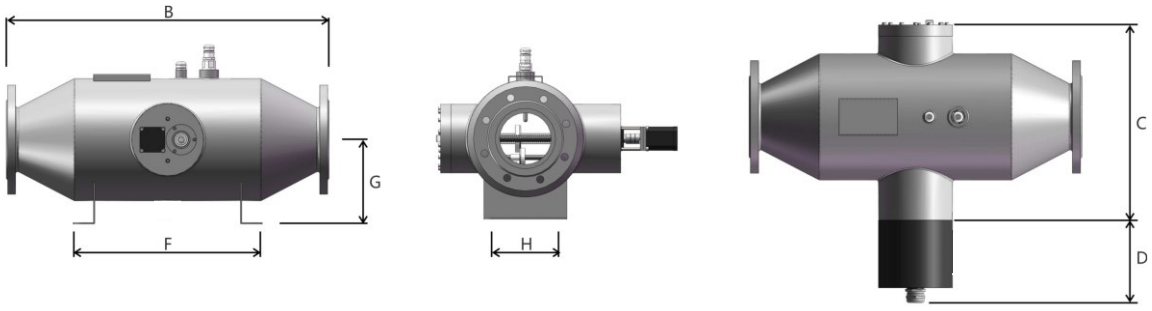
2.0-Description of the Equipment

2.1-Summary

EMAUX NT-MPUV Series ultraviolet equipment is designed specially for water processing factories. The pressure container of the reactor is made by 316 stainless steel, which contains end flange, lamp and quartz tube, power-driven wiping device, ultraviolet monitor and temperature sensor of reactor.
Each reactor is equipped with electrical control panel which can be installed on the wall or on the floor, on which there are front controller and indicator of full-automatic high efficient electrical ultraviolet bactericidal lamp's electric source (ballast resistor), controlling system and forced air cooling device.

2.2-Technical Data

Details of the reactor:

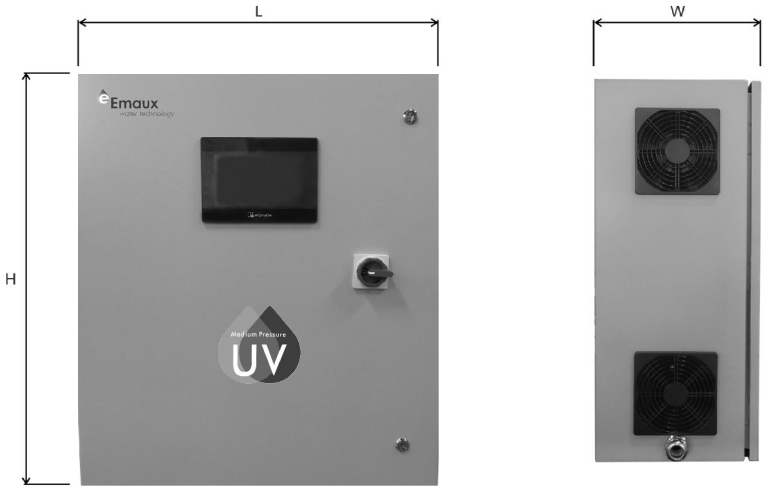


CODE	CONTROLS	CONTROL PANEL DIMENSIONS mm (LxWxH)	REACTOR DIMENSIONS (mm/inch)						
			A	B	C	D	F	G	H
931115882	NT-MPUV40	600x 300x 700	80/3.0	740/29.1	422/16.6	195/7.7	300/11.8	200/7.9	170/6.7
931115883	NT-MPUV60	600x 300x 700	100/4.0	740/29.1	422/16.6	195/7.7	300/11.8	200/7.9	170/6.7
931115884	NT-MPUV105	600x 300x 700	150/6.0	800/31.5	422/16.6	195/7.7	400/15.7	200/7.9	170/6.7
931115884	NT-MPUV145	600x 300x 700	150/6.0	820/32.3	585/23	195/7.7	400/15.7	275/10.8	250/9.8
931115885	NT-MPUV170	600x 300x 700	150/6.0	820/32.3	585/23	195/7.7	400/15.7	275/10.8	250/9.8
931115886	NT-MPUV220	700x 300x 1100	200/8.0	890/35.0	422/16.6	195/7.7	450/17.7	225/8.8	250/9.8
931115886	NT-MPUV300	700x 300x 1100	200/8.0	890/35.0	585/23	195/7.7	450/17.7	275/10.8	330/13
931115887	NT-MPUV355-415	700x 300x 1100	250/10.0	890/35.0	585/23	195/7.7	450/17.7	275/10.8	330/13

CODE	NT-MPUV MODELS	CONNECTION	FLOW RATES		LAMP POWER	SUPPLY RATING
			m³/h	US gpm	KW	V/ph/Hz
931135873	NT - MPUV40	DN80	40	175	1.0	200-240/1/50
931135874	NT - MPUV60	DN100	60	264	1.5	200-240/1/50
931135875	NT - MPUV105	DN150	105	460	2.0	200-240/1/50
931135876	NT - MPUV145	DN150	145	640	2.5	200-240/1/50
931135877	NT - MPUV170	DN150	170	750	3.0	200-240/1/50
931135878	NT - MPUV220	DN200	220	970	2 x 2.0 = 4.0	200-240/1/50 360-380/3/50
931135879	NT - MPUV300	DN200	300	1320	2 x 2.5 = 5.0	200-240/1/50 360-380/3/50
931135880	NT - MPUV355	DN250	355	1560	2 x 3.0 = 6.0	200-240/1/50 360-380/3/50
931135881	NT - MPUV415	DN250	415	1825	2 x 3.5 = 7.0	200-240/1/50 360-380/3/50

*Supply rating must be specified with order.

Detailed materials of typical panel:



Model	L (mm)	H (mm)	W (mm)
NT-MPUV 40	600	700	300
NT-MPUV 60	600	700	300
NT-MPUV 105	600	700	300
NT-MPUV 145	600	700	300
NT-MPUV 170	600	700	300
NT-MPUV 220	700	1100	300
NT-MPUV 300	700	1100	300
NT-MPUV 355	700	1100	300
NT-MPUV 415	700	1100	300

2.3-Electrical and Environmental Data

Conditions of environment:

Temperature of Operating Environment	5...35 ℃
Temperature of Transporting and Storing	-25...+55 ℃
The annual average air humidity 60 days per year Occasionally	<65% 85% 95%
Condensed/bad environment	Try to avoid
Grade of installation and protection	IP 54
Vibrating/Pounding	Should be installed in an environment without vibration
Grade of the intensity of sound	<85 dB(A)

Electrical data

Model	Power	Circuit breaker of power supply	Options of voltage between lines	Line current	Power consumption of line
NT-MPUV40	1.0 KW	32A Single phase	220-240V/50Hz	7A	1.5KW
NT-MPUV60	1.5 KW			9A	2.0KW
NT-MPUV105	2.0 KW			12A	2.5KW
NT-MPUV145	2.5 KW	40A Single phase		14.2A	3.0KW
NT-MPUV170	3.0 KW			17A	3.5KW
NT-MPUV220	2*2.0 KW	40A (Single phase/ Three phase)	220-240V/50Hz 360-380V/50Hz	21A/8.5A	4.5KW
NT-MPUV300	2*2.5 KW			25A/10.4A	5.5KW
NT-MPUV355	2*3.0 KW			30A/12.3A	6.5KW
NT-MPUV415	2*3.5 KW			34A/14.2A	7.5KW

Pulse ignition voltage of lamp, operating voltage and the AC power supply voltage of 260V lamp.
Within the control circuit: 110-115V ac or 220-240Vac, 24V dc.

3.0-Safety Measures and Regulations

The installation, running and maintaining of the equipment should be implemented by professionals who have been trained. Owner and/or user of the equipment must ensure that operators have received appropriate guidance. Damage analysis has been done to this equipment, safety measures have been made for relevant personnel and livestock. However, improper use, deficiency of maintenance, changes to the materials etc. also may cause dangers. These dangers are relevant to the following factors:

- ☐ Power
- ☐ Mechanical dangers
- ☐ Exposure to high intensity of ultraviolet

3.1-Power

The symbol of lightening and arrow is to warn users: un-insulated "Dangerous Voltage"exists in the outermost shell. The equipment can only be switched on when the main power cut off. When the equipment is on, power supply cannot be restored. Also is applicable to electrical control panel and the container of reactor.

Note:
It is prohibited to operate on electrified equipment.

3.2-Mechanical Dangers

Wiping system of reactor is equipped with rotary parts, so the dismantling of the cover of driving device of the wiper should only be done by trained personnel after the equipment has been cut off.
The equipment is equipped with glass parts, so it should be handled with care.

3.3-Exposure to high intensity of ultraviolet

The reactor is equipped with ultraviolet lamp, if someone is exposed to ultraviolet in the case of power on, his eyes and skin may be injured seriously. Before opening the cover of the reactor, please ensure that the main power is cut off.

Warning:
Exposure to ultraviolet may cause injures to eyes and skin. Before opening the end plate of the ultraviolet lamp, the power of the ultraviolet should be cut off firstly.

4.0-Installation Guidance

4.1-Installing Ultraviolet Equipment

The control panel of ultraviolet equipment is designed as clapboard installation (NT-MPUV40 to NT-MPUV415), and the rear shell mounting bracket with lashing eye is used. Relatively big model （NT-MPUV620 toNT-MPUV1000) is installed on the ground, and should be placed on the base which is 100 to 150mm high.
The installation of pressure casing of reactor uses the mounting bracket fixed under the outer shell.

Import Indication:
The control panel of the reactor uses air cooling. The following instructions should be followed when positioning the device:

- Reactor and control panel cannot be placed in a place which the temperature of surrounding air exceeds 400C.
- Equipment that directly emits heat should not exist around the location of the reactor and control panel.
- Chemical equipment that may emit gas should be exist around the location of the reactor and control panel.
- The reactor should be placed in a recycled pipe system, in which there must be enough space for changing lamp and maintaining the wiper. Please refer to relevant data contained in this manual.
- Reactor can be installed before or after the filter of the swimming pool. If it is installed after the filter of the swimming pool, it is suggested to install a mesh filter basket on the downstream of the reactor, during the operation and maintenance of the reactor, in case the inner light tube breaks, which is very unusual, the filter basket can prevent grass fragment from entering into swimming pool.
- It is suggested to install a bypass pipe with valve around the reactor in the main pipe, and at the same time install isolating valve on the inlet and outlet pipes, so that during the maintenance the water in the swimming pool can flow through the bypass pipe around the reactor.
- If possible, the chemical feed pipe should be installed on the downstream of the reactor.

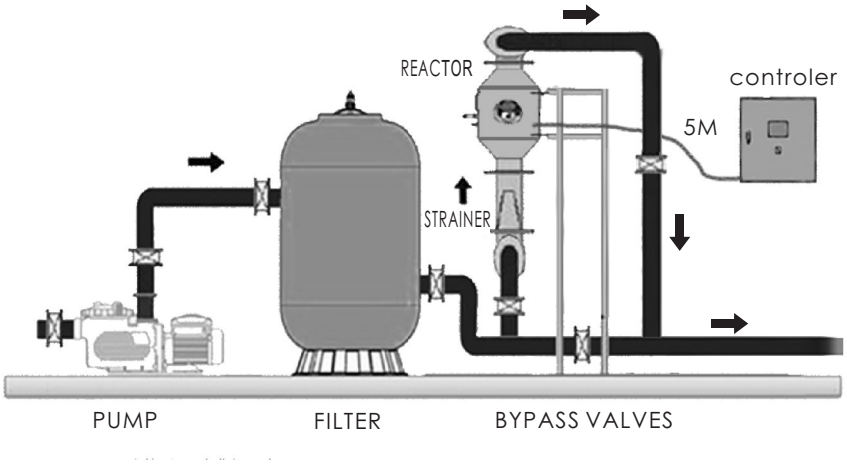
Information:
It is prohibited to install the reactor in a place neighboring the chemical feed position.

Information:
Pressure shell mounting bracket can only be used to support the reactor, please ensure that all connections are supported by other means.

The violation of the above mentioned rules may affect the running and maintaining of the equipment, and may bring side effect to the long-term validity and service life of the equipment.

4.2-Mechanical Connections

The pressure shell of the reactor is equipped with connecting flanges of HG-20592.PN1.0 Mpa pipe system. When making the order, please note the type of flange needed. Please refer to Section 2.2 for sizes of relevant flanges. Isolating valve should be fitted in the inlet and outlet pipes to the reactor, so that isolation can be done when doing general maintenance.



Vertical installation method

4.3-Electrical Connection

Power
Connecting the main power on the bottom of main chain isolator on the control panel.

Information:
Connecting the main power on the bottom of main chain isolator on the control panel.

Information:
The sizes of the electric cable and the power supply circuit breaker should reach the local regulations listed in Section and specified requirements.

Information:
Electrical installation should be done by appropriate and qualified electrician. Power supply connected with the equipment should be landing.

Landing / Landing Connection
It is required to connect a ground conductor between the ultraviolet pressure shell and control panel, which sizes should be as followed:

NT-MPUV 40 --- NT-MPUV 170	2.5 mm²
NT-MPUV 220 --- NT-MPUV 415	4 mm²

For Model NT, it is required to connect a single core copper conductor between the ultraviolet pressure shell and the control panel. The conductor should at least be connected by 2.5mm² and 4mm² copper conductor, Chinese Standard.

Information
Connection positions of the following options refers to the schematic diagram.

Remote Indication

The following remote indications can be provided:

- The fault of switching on of the ultraviolet lamp.The intensity of ultraviolet is low, lamp should be changed
- Remote indication comes from non contact voltage (V.F.C.).
- The maximum voltage current of V.F.C. is 230V ac 1A.
- All contacts are closed when displaying.

Remote Open/ Close

- The ultraviolet light can be remote controlled by a voltage-free switch, which the rated voltage and current should be 24VDC 1A
- The power supply is supplied by the control box, and it is not suggested to use external power supply so as to avoid the damage to the controller; the mode of connection refers to electrical wiring diagram.

Retransferring of the Intensity of Ultraviolet

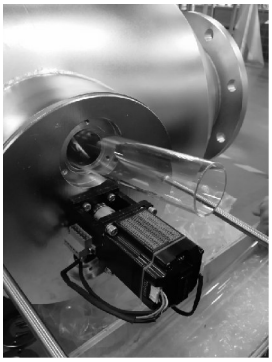
The intensity of ultraviolet can be re-transferred to remote location. Signal 0-20mA (the utmost load shouldn't exceed 500 Ohms). Or signal 0-10V dc.

The value depends on the intensity options chose, which is among the following options:

- Percentage (Proportional Reading) 0mA = 0%, 20mA = 100%
- Intensity (values from the sensor) 0mA = 0 W/m², 20mA = the value to a decimal place which is displayed on the intensity screen.

4.4-Install the lamp

1



Put on a clean white glove,take out the wrapped quartz tube,remove the lamp holder connector at the lower end,and place the quartz tube in the reactor.

2

Seal rings at both ends of quartz tube.

Fix the socket gap of the lamp tube to connect the socket gap and fix the screw at the end.

3

Place the connected lamp tube slowly into the quartz tube from one end of the motor and fix the end screw.

4

Warning/Indication:
Check that all screws are fastened and prevent leakage.

5.0-Test Running

5.1-Preparations of Test Running

Preparations:

• Personnel for the test running, who are authorized by the owner and/or user of the equipment, should read and understand the operating specification.

• Personnel for the test running must be familiar with safety measures and regulations applicable for the country/region in which the equipment is installed.

5.2-Checking the Installation

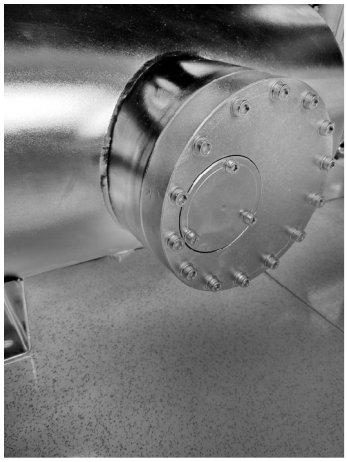
The following items should be checked before connecting the power:

• Whether the control panel has been fixed to prevent moving?
• Whether the power supply circuit connecting to the control panel has been protected?
• Whether there is enough space around the location of installation?
• Whether the pipes have been connected tightened?
• Whether the isolating valve of the reactor is close?
• Whether there is adequate ventilation to ensure the normal running of the equipment?
• Whether the equipment has been electrical interlocked with the main circulating pump of the swimming pool?

Note:
Ultraviolet lamp is prohibited to be electrified without water flow. Violation of this indication will affect the life span and tightness of the lamp.

5.3-Test Running of the Equipment

• Check whether the main power supply has been isolated from the control panel.
• Check whether the power line of the wiper has been properly connected with the engine of the wiper.
• Check whether the temperature sensor of the reactor has been installed on the top of the reactor.
• Check whether the ultraviolet sensor has been installed and be connected with the electric cable of the sensor.
• Loosen the fixing screw on the panel of the linker of the lamp at one side of the pressure shell, and then take it off.



Information

Ultraviolet lamp is not provided after having been installed; instead, it is put into an independent box together with ultraviolet equipment.

Information

Never tough the glass of ultraviolet lamp and quartz tube with hand. When carrying them, clean white gloves should be worn. They are supplied in the packing box of the lamp appliances.

• Store the lamp on a clean and dry plane.
• Take down the opposite lamp base adapter.
• Inspect visually whether the quartz tube in the pressure shell of the reactor has the possible breakage due to the installation of reactor.
• If the quartz tube looks perfect, open the water isolation valve and let the water submerge the reactor.
• When proper water flow go through the reactor, check whether there is leakage around the gasket ring of the quartz tube or in the quartz tube itself.
• Ensure that the inner of the quartz tube is totally dry.

Indication

The surface of the inner of the quartz tube and the ultraviolet lamp should be totally dry. If this cannot be ensured, it may cause the shortening of life span of the lamp.

• Install the lamp base adapter on one side of the pressure shell.
• Insert the ultraviolet lamp from the other end, ensure that the plug of the lamp has been fixed into the socket of the linker securely.
• Re-install the reversed lamp socket connector, ensure that the socket has been fixed with the lamp plug securely.

Information

Before fixing the lamp base adapter properly on the pressure shell using provided screws, never switch on the power of the control panel.

• Open the front door of the control panel, check visually whether there are obvious damages which may be caused by the installation of main power supply cable.
• Do manual tensile testing to all inner cable ends, ensure that all ends haven't got loosen during the process of transportation or installation.
• Reset all circuit breakers. (MCB's)

Information

Before re-starting the power of the control panel, please ensure that the lamp socket connector has been fixed properly, the connection of the engine of wiper has been disconnected properly and the cover has been fixed properly.

• Re-connect the main power supply on the control panel.
• Measure the power supply voltage at the input end of the isolator of the control panel, check whether the data is compliance with the voltage displayed on the plate.
• Position the isolator of the door to "ON" .

Information

Just as specified in the process of starting, HMI (human-computer interface) should display the trademark of EMAUX, the model and the version of software. Approximately 5 seconds later, the default screen will be displayed.

• Set display language that will be used (refer to the specifications in Section 6.8) (Default language is English).
• The system controlling set as local (refer to the specifications in Section 6.2)
• Set the time of automatically wiping (refer to the specifications in Section 6.3) (Default time is 72 hours).
• Start the model of manually wiping, check whether the wiper run or not (refer to the specifications in Section 6.3)
• Since the operation of the wiper cannot be seen visually, it is sufficient to hear the sound of operation of the motor. The driving system of the wiper will wipe in one direction, then does it reversely, and then returns to the starting point.
• Set the time of automatic power reduction, and position it to the position of closing (refer to the specifications in Section 6.4)

• Set manual power reduction to full power (refer to the specifications in Section 6.5)
• Set the clock to correct date and time (refer to the specifications in Section 6.6)
• Set the warning temperature of the reactor and control panel (refer to the specifications in Section 6.12)
(The default temperature of control panel is 50℃, and the default temperature of the reactor is 45℃).

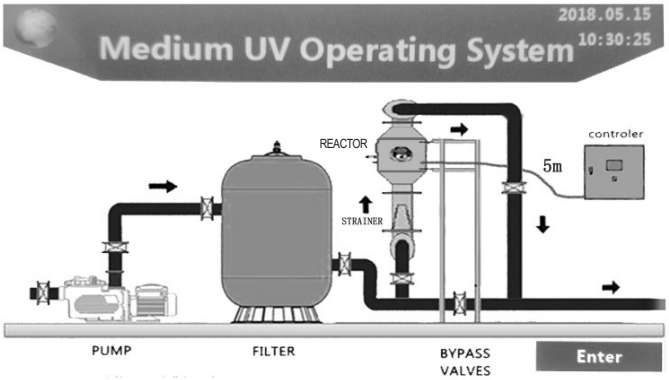
Information
If the triangle warning symbol flashing on the screen, please click this symbol with your hand. Go to the fault screen, refer to corresponding contents in the chapter of troubleshooting, find the details of the fault as well as required actions. In need, it maybe required to click the reset button, clear fault messages caused by circuit breaker error and the installation of equipment.
In the case of power on:
• Check whether the cooling fan has been started.
• Check whether the readings of the temperature of the reactor is close to the water temperature which flows through the reactor. The readings may have discrepancies, because what displayed is the temperature of the outer skin of the reactor, which will be affected by surrounding air temperature.
• Press the switch of the lamp to start the ultraviolet lamp. The status of the lamp will be displayed on the screen with words.
• 15 minutes after the lamp has been switched on and in the case of properly running of the equipment, finish the aligning of the ultraviolet detector (refer to the specifications in Section 6.10)
• Test the readings of the intensity of ultraviolet (refer to Section 6.9). Displayed value should be 100% or xx.xW/m² (if choose to display intensity by this means).

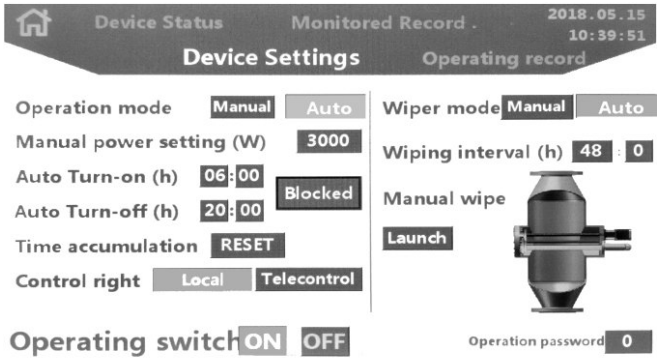
Information
Under certain circumstance, the reading of the displayer will be mW/cm², if when making the purchase, the client requires to display the intensity by this intensity option. The default displayed reading is % value.

Information
Changing the flow and quality of the water may affect the readings on the intensity detector of ultraviolet.
Now the equipment is under usable connection, the following parameters:
• System control
• Automatically reduce the capacity
• Correct operating conditions should be set.

6.0-Operating

The equipment can only be operated by personnel authorized by owner and/or user of the equipment. The owner and/or user can determine how many people will operate the equipment and whether instructing other personnel to operate some functions, such as "emergency braking" etc.
Owner and/or user of the equipment must ensure that the authorized personnel are also familiar with safety measures and regulations except reading carefully and understanding operating specifications; also, they should abide by these measures and regulations.





Open host operating interface and enter the set interface of the host operating.

6.1-On/off of the Ultraviolet Lamp

The pre-condition of operating is:
- There is water flow by in the pressure shell.
- The power of the control panel has been connected, and the isolator of control panel is ON.
- There is no fault registering displayed on warning display.

Information
If the alarm on the display sounded, it indicates failures or waning indications. Please refer to Section 8.0, i.e. troubleshooting.
- The ultraviolet light has been off at least 5 minutes.

Information
Once the ultraviolet lamp is off, if you try to re-start the ultraviolet equipment within 6 minutes, count-down will be shown on the screen, until the indication of automatic re-start appears on the screen. This is to ensure that the ultraviolet lamp has been properly cooled, so that the ultraviolet lamp can be re-started successfully.
Switching on the Ultraviolet Lamp.
- Click on/off button of the lamp.
- The light color on the indicator (on main display) should be changed from gray to blue, which an indication that the system has been started. Aslo, the word indicating on/off on the screen turns to ON.

Information
If within 6 minutes after the ultraviolet light has been off, the count-down on the main display is triggered, it will display beside the status of the lamp. After the count-down has been finished, the lamp cannot start automatically; instead, it needs to be started manually.
The time-lapse can be changed with the scope of 10 to 600 seconds. Without communicating with EMAUX, this setting shouldn't be changed, because if it is set to be started in a short time will cause problems on operation. Only after the ultraviolet lamp has been electrified for at least 5 minutes does the ultraviolet lamp can reach the proper working temperature, current and rated ultraviolet output.
Turn off the ultraviolet lamp:
- Press ON/OFF button of the lamp.
- The indication of light is on the main display, so as to ensure that the equipment has been powered off. The word indication of the light will be: OFF.

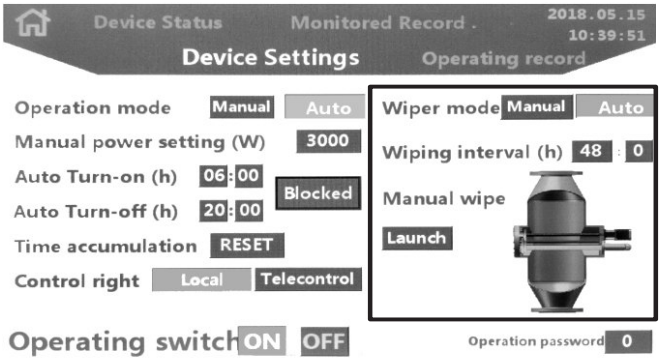
6.2-Controlling of the Equipment

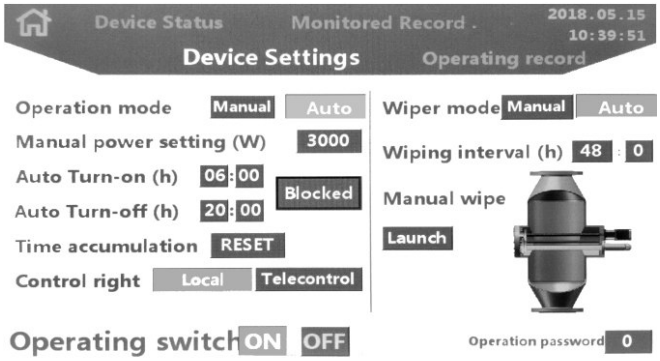
Control system can choose a remote ultraviolet lamp switch-gear, which can realize the remote controlling of the lamp by using non-voltage contact. If this option is chosen, the ON/OFF button of the lamp on the control panel lost its function. This function can be used for the integration with the building management system or for the linkage with the main recycling pump or flow volume switch of the swimming pool.Using this option .
- Check whether those external connections required by this function have connected properly.
- Press the remote function key on the control system, and then the control mode will be changed from local to remote. Now the ultraviolet lamp is controlled by remote non-voltage switch.

Information
The rules of the remote operation of the equipment is the same as the manual operation.

6.3-The Controlling of Wiper

The control system can realize the controlling of time-controlled automatic wiper. The storing and controlling of the period of wiping will be done by the control system. Once the period is over, the wiper will finish the wiping of lamp tube, and then will be back to the initial position. The timer will be re-set, and the process of wiping will be repeated. If it is needed, the control system can also start manually wipe.
Starts manually wipe:
- Press the manually wipe button on the display, then the system will start the model of manually wiping. This will display on the figure of wiper motor on the main display.
- Press the figure of wiper motor on the main display can enter the function of automatic wiping.
- Controlling screen of the wiper will be displayed, and options of setting the time of automatic wiping or terminating the function of automatic wiping.



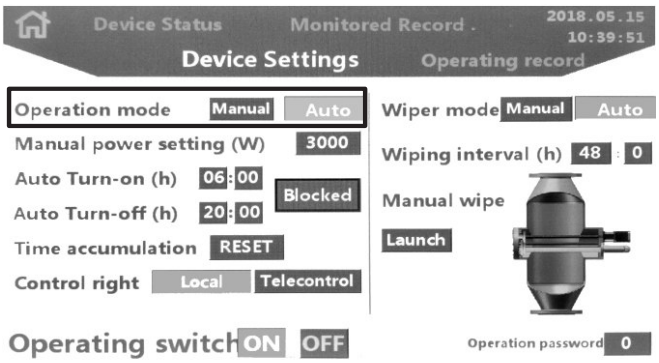


Warning/Indication:

Within 30 minutes, don't repeat the function of manual wiping for more than 3 times, because it will cause the overheating of the wiping motor and other potential damages.

6.4-Automatically Reduce Power

The control system has the function of operate the ultraviolet lamp between full power and low power. It is optional of manual control or automatic control. When using the function of automatically power reducing, the operation mode of the chosen switch on the screen should be set as automatic.



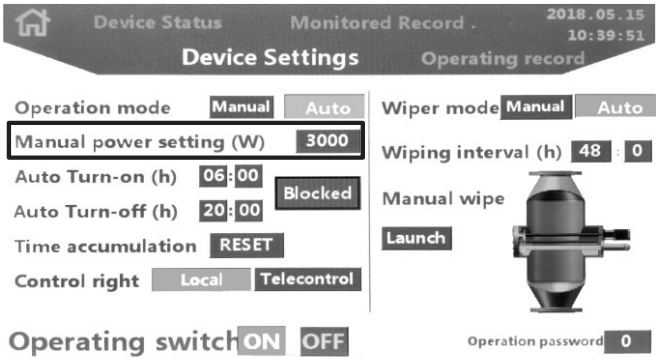
Information:

In order to properly fulfill the function of automatic power reducing, the time-clock should be set on the accurate time. (Refer to Section 6.6)

When choosing the function of time-controlled on/off, the ultraviolet lamp can be operated when the swimming pool is open, and at other times, the lamp will be off. By doing so, the changing time of the ultraviolet lamp can be extended.

When choosing automatic function, the ultraviolet lamp can be operated full-power when the temperature of the reactor is below 40℃, and when the temperature of the reactor is over 40℃, the operation of the ultraviolet lamp can be linear automatically adjusted between the full power and the low power. When the temperature of the reactor is over60℃, the ultraviolet lamp will be off automatically, and the warning indication will be given out; when the temperature of the reactor is below40℃, after has been off for 5 minutes, the ultraviolet lamp will be re-started automatically.

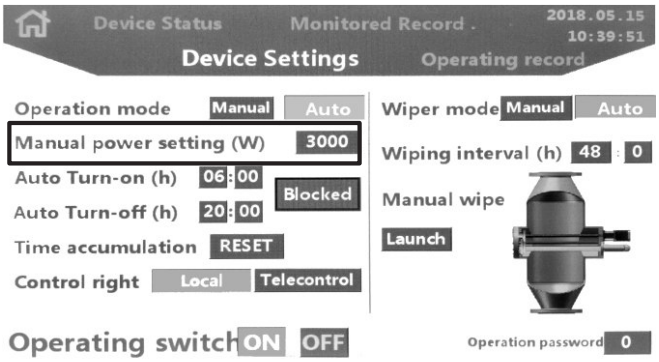
If the factory setting of the system is the mode of manual control, whenever the system is powered off, the control mode will be restored to factory setting. It is needed to be reset.



Information:
When the automatic option is chosen, the function of manual power reducing cannot be used. Depending on the set starting time, it is possible that before the next transferring time, the power will not be changed.

6.5-Manual Power-reducing

The control system has the function of setting the power manually, including full power and low power.
When using this function:
Check whether the function of operation mode has been set as manual, press the value setting of manual operation power, then a digital keyboard will be popped up, input the proper value and then press the key of ENT to exit.
The minimum range of the input value is 40% of the full power.

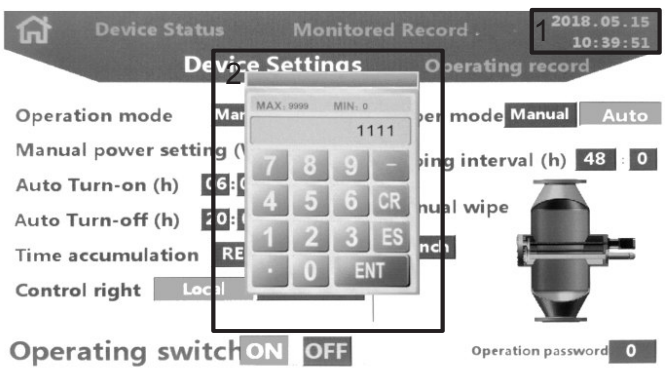


Information:
When the option of manual power reducing has been set, the lower the operation power has been set, the smaller the reading of the intensity of ultravioletwill be. The failure alarm of low ultraviolet intensity may be triggered; when using the automatic power reducing, the situation may the same.

6.6-Clock

The control system includes a real clock which can set date. In order to properly run all system functions, the time and date set should be adjusted to correct time.When setting the clock, press the green clock symbol at the right hand side of the main display.

・Press time/date display and input value.

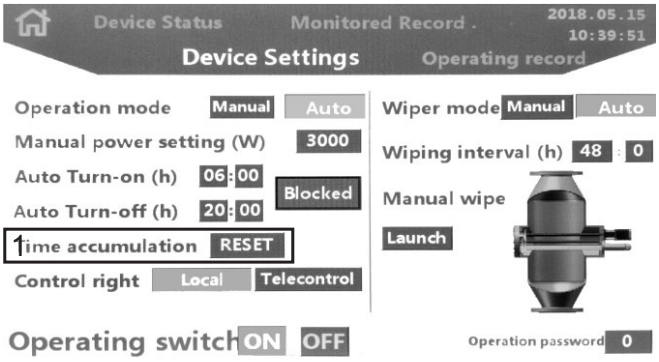


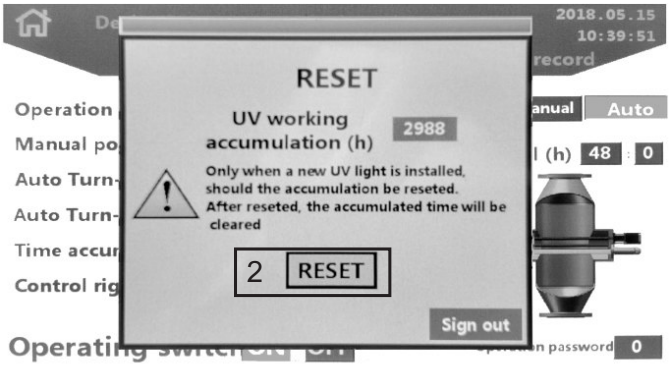
Information:
The time is set and showed in the form of 24 hours.

Information:
On the setting screen, the time clock will stop. Now the main screen should display the accurate date and time.
When setting the year, it's only needed to input the last 2 digits of the year, and then press the key of ENT; continue to input corresponding value.

6.7-Number of Hours of Operating

The control system includes a timer, which records the total time of starting the control panel (system hour) as well as the total time of the starting of ultraviolet lamp (lamp hour). The number of periods is also recorded. This is the number of times of switching on and off of the ultraviolet lamp since the last changing of lamp.
If the warning of "needing to change lamp" appears, the ultraviolet lamp should be changed, and then it is needed to re-set the number of hours of the lamp (the period of switching on and off of the lamp will be re-set automatically). Press the figure of control panel on the main display to check the number of hours and re-set time.



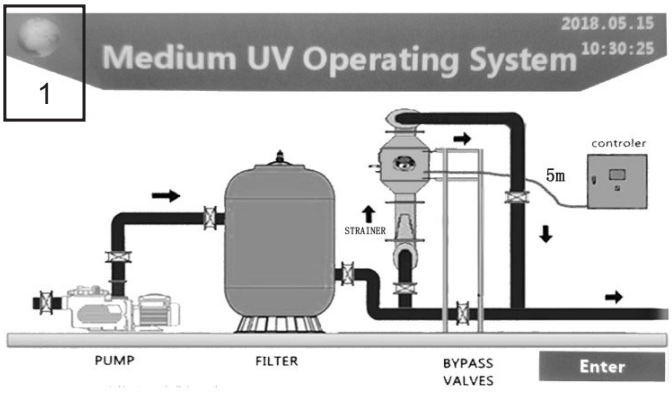


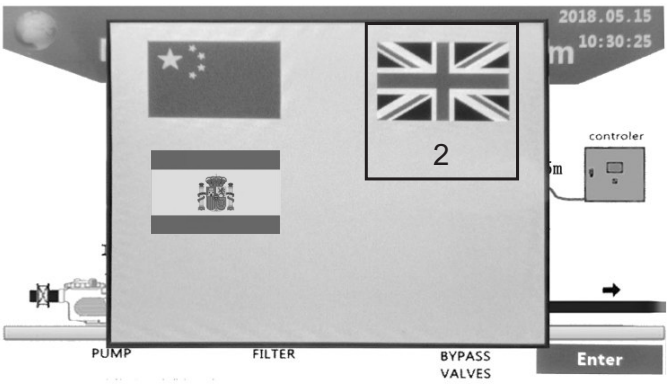
Information:
It is impossible to re-set the number of hours of the system.

Important Indications:
The number of hours should only re-set when a new ultraviolet lamp is installed.

6.8-Language

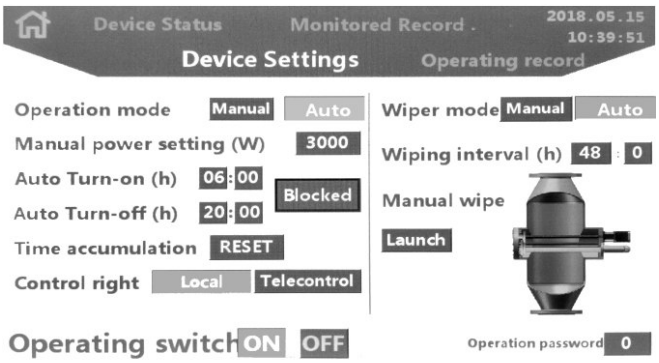
When it is needed, the display language can be changed into English, Spanish or German. When the language is reset, press the icon of earth at the upper left corner of the main screen, select the corresponding national flag of the language to be selected.



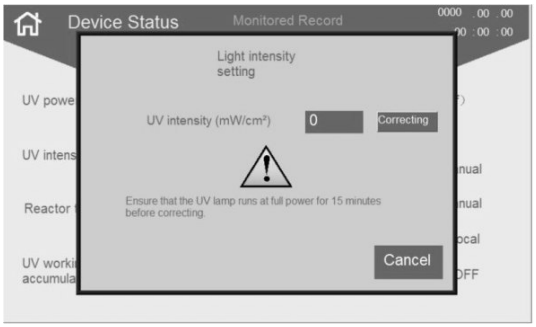


6.9-The Intensity of Ultraviolet

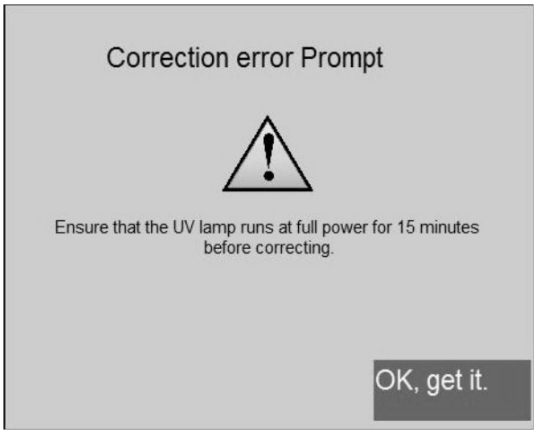
The control system contains an ultraviolet monitor, which can constantly measure the intensity of the ultraviolet light on the inner wall of the pressure container. If the value is below the set value input in the ultraviolet intensity screen, the alarm of "low ultraviolet intensity" will be given out If the system is displayed with relative readings（%）, the default set value is that the ultraviolet intensity under full power is 100%.



Light intensity setting

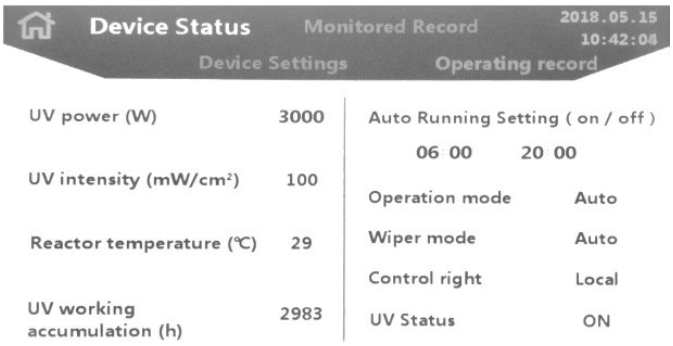


Correction error Prompt



6.10-Operating Value

The control panel and pressure container is equipped with temperature-controller, which monitors the surface temperature of the controlling reactor in the position of the sensor. Also it is equipped with the controller monitoring the operating power in the circuit of the ultraviolet lamp. All these values display on the main screen.Except the number of hours of the lamp and the number of periods, the operating of the lamp also displays on the displaying screen.



6.11-Warning Temperature

The alarming point for the pressure container can be set, so that when the temperature is above the expected value, (the expected value of the temperature of the panel is set as 60℃ when it leaves the factory), the ultraviolet lamp will stop operating, so that important parts can be protected against damages.

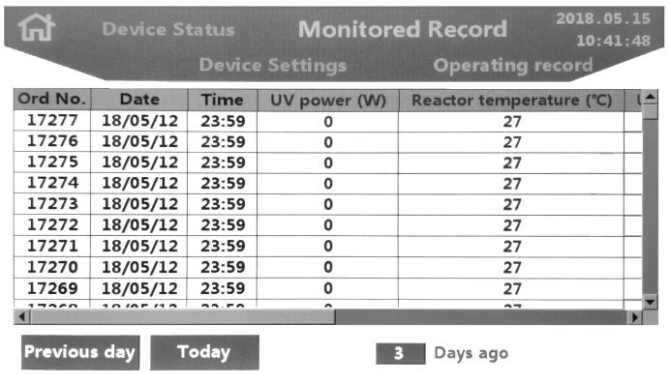
Information:
The displaying temperature is degree Celsius.

Information:
Unless there is a special case, the warning temperature should not be changed.

Important Indication:
The temperature error of the reactor is to protect the equipment from overheat in case of low flow or no flow. It is not a controlling equipment, and should be used to substitute the interlink between the equipment and the main recycling pump of the swimming pool.

6.12-Data Record

The control system can record the value of main parameters. Through pressing data recording, one can check these data. Data for up to six days can be checked.



THE MAIN DISPLAY OF THE TENDENCY

6.13-Wipe motor fault

7.0-Maintenance

The maintenance can only be done by personnel who have received training and who have been authorized by the owner and/or user of the equipment. The owner and/or user of the equipment must ensure that the personnel for maintaining are familiar with safety measures and regulations except reading carefully and understanding the operating manual, and at the same time they can implement them.Only replacement parts provided by EMAUX Company can be used.
The following are the suggested maintenance period of replacement parts:

The changing of ultraviolet lamp	According to the indication on the control panel (The normal is 8000 hours)
The changing of the tube of ultraviolet lamp	one time within 2 years
The ring of ultraviolet wiper	one time within 2 years
Changing of the filter pad of the control panel	Changing together with cleaning or changing the ultraviolet lamp

Also, the driving organism of the wiper should be examined once a year.

Warning/Indication:
If the equipment hasn't been used for more than 1 week, the water in the pressure container should be drained out, and the container should be cleared thoroughly with drinking water.

7.1-Changing Ultraviolet Lamp

If the indication of "the lamp need to be changed" displayed on the warning/alarming screen or given out at the remote indicating terminal, the ultraviolet lamp needed to be changed. The interval of the changing of lamp is 8000 hours.
When changing the lamp:
Check whether the main power supply connected to the control panel has been cut off.
After the lamp has operated for 5000 hours, prepare for the changing of the ultraviolet lamp.

Warning/Indication:
Before implementing the following procedure, please ensure that the power has been cut off or the ultraviolet lamp has been powered off for at least 15 minutes. This is to ensure that the remaining heat of the lamp has scattered.

- At one side of the pressure container, loosen and dismantle the three fixed screws on the socket connector.
- Hold the pin connector or the porcelain part of the lamp, move the lamp out, and ensure that the fingers don't touch the surface of the glass of the lamp.
- When the lamp is moved out, the other end should appear. Hold the porcelain end of the lamp and take out the whole lamp body.
- Observe the inner components of the lass tube of the reactor, check whether there are signs that it may break or leak water during the process of operating.
- Ensure that the lamp tube is totally dry outside.
- Insert new lamp.

Information:
Never touch the glass and quartz tube of the ultraviolet lamp. Clean white cotton gloves should be worn when carrying glass.

Indication:
The inner of the quartz tube and the ultraviolet lamp should be dry totally. If this cannot be reached, the service life of lamp may shorten.

・Re-install the lamp holder joint, ensure that the fixed screws have been re-installed properly; if the installation is not right, warning signal will be given out and the operation of the lamp will stop.

Information:
Before installing the socket connector properly, never start the power of the control panel.

・Before re-starting the equipment, firstly re-set the number of hours of the operating of the lamp according to the descriptions in Section 6.7.

・When re-starting the lamp, check and align the readings of the intensity of ultraviolet according to the descriptions in Section 6.9.

7.2-Changing the Tube of Ultraviolet Lamp

The tube of the ultraviolet lamp should be changed after 2 years of operating （or during of process of changing the ultraviolet lamp much closer to this time）.

・Check whether the main power of the control panel has been cut off.

Warning/Indication:
Before implementing the following procedures, please ensure that the power has been cut off or the ultraviolet lamp has been powered off for at least 15 minutes. This is to ensure that the remaining heat of the lamp has been scattered.

・Stop the water flow to the reactor through operating bypass valve or closing recycled pump.

Information :
If the main recycled pump has been closed, the water in the swimming pool will not be filtered or processed chemically during this time.

・Close the isolating valve which is installed on the inlet and outlet pipes of the pressure container of the reactor.

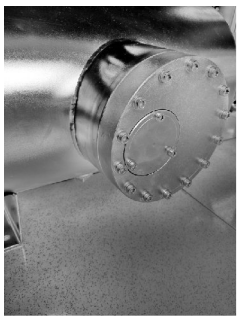
・Take down the drain plug at the bottom of the reactor, clear all water in the reactor.

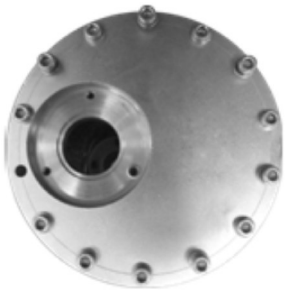
・At one side of the pressure container, loosen and dismantle the fixed screws on the socket connector.

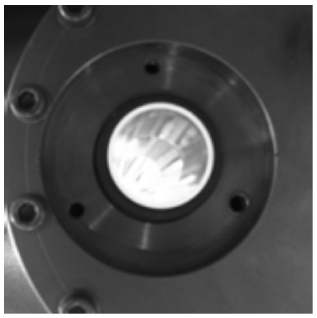
・Take down the ultraviolet lamp using the above mentioned methods.

・Take down the opposite socket connector.

・Unscrew 3 M5 internal hexagonal fixing screws and take out 2 quartz tube chucks.

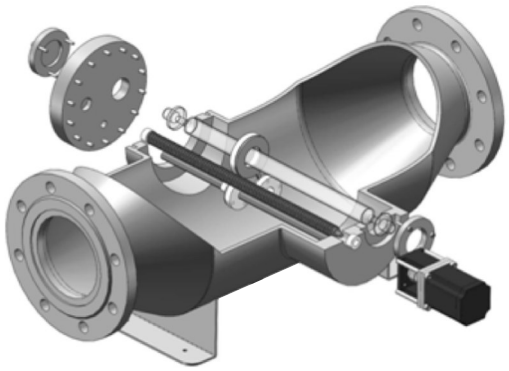






・Withdraw the quartz tube and take down the gasket ring.

・Insert new quartz tube, carefully ensure that it goes through the wiper ring and comes out from the other end of the reactor. The tube should be equally at the two side of the reactor.



SCREW STEM
QUARTZ TUBE
SEAL BLOCK OF THE REACTOR
WIPER PLATE ASSEMBLE
REACTION MEMBER
QUARTZ TUBE FIXING RING 2

Information:
Don't' touch the new quartz tube with hand. When carrying the glass, please wear clean white cotton gloves.
・When installing new O-shape gasket ring, firstly put them on the ends of the quartz tube and then press into sealing ring groove.
・Put the 2 clamps at the two ends of the quartz tube.
・Slightly push the clamps to the right position, ensure that the quartz tube is on the center of the body of the reactor.
・Fix the location of chucks and the reactor, and install M5 fixing screws.
・Check visually whether there are signs of breakage of the quartz tube around the gasket ring, and whether the gasket ring has been pressed onto the quartz tube.
・Re-install the drainage plug on the reactor.
・Slowly open the isolating valve and let the swimming pool water slowly submerge the reactor.
・Check the sealing of the gasket ring and whether there are signs of leakage of the quartz tube. If there is leakage of water, the water should be isolated, then check and re-seal, or change the quartz tube or gasket ring if it is needed.
・Open the bypass valve or start the main recycling pump, let the water flow into the reactor.

Information:
Depending on the position of the reactor in the system, at the initial several minutes of letting the water flow into the reactor, there may be a small amount of air entering the swimming pool.
・Check the sealing of the quartz gasket ring, ensure whether there are signs of leakage, and let the equipment run for 15 minutes. If there are signs of leakage, isolate the water using the methods described above, check and re-seal; in need, change the quartz tube or gasket ring.
・After the quartz tube has been sealed, the interior of the quartz tube should be checked, ensure that it is clean and dry. In need, it can be cleaned or dried with clean cloth.

Indication:
The inner surface of the quartz tube and the ultraviolet lamp must be totally dry. If this cannot be ensured, the service life of the lamp will be shortened.
・Re-install the lamp base adapter at one side of the pressure container.
・Insert the lamp again.
・Re-install the opposite lamp base adapter, ensure that all fixing screws have been re-fixed properly.

Information:
Before installing the lamp base adapter properly, never power on the power of the control panel.
Now the equipment can be re-started according to the methods described before.

7.3-Changing the Wiper Ring of the Quartz Tube

After using 2 years (or in the process of the last changing of ultraviolet lamp), the wiper ring of the quartz tube should be changed.
・Check whether the main power of the control panel has been cut off.

Important Indication:
Before cutting of the power, please ensure that the system has completed the automatic wiping of any quartz tube, and the wiper is on the parking model.

Warning/Indication:
Before implementing the following procedures, please ensure that the power has been cut off or the ultraviolet lamp has been off for at least 15 minutes. This is to ensure that the remaining heat of the lamp has been scattered.

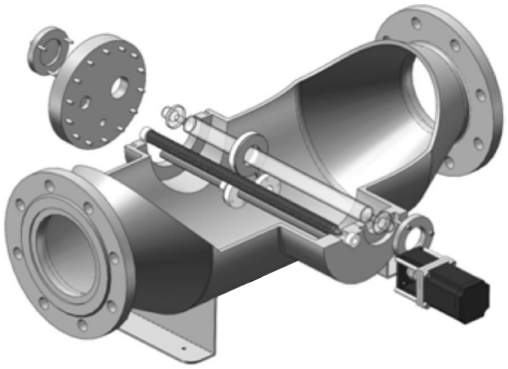
・Through operating the bypass valve or closing the recycling pump to stop the water flow to the reactor.

Information:
If the main recycling pump is closed, then the water in the swimming pool cannot be filtered or disposed chemically during this time.

・Close the isolation valve installed on the water inlet and outlet pipes of the pressure container of the reactor.
・Take down the bottom drainage plug at the bottom of the reactor, drain out all water in the reactor.
・Take down the ultraviolet lamp and quartz tube according to the methods mentioned above.
・Take down the nuts of flange plate of the reactor and put it aside.
・Now the wiper shaft and gasket ring assembly can be seen.

Important Indication:
Once the front plate of the reactor is taken off, the driving shaft of the wiper will only be supported on one end. Therefore, great attention should be paid not to put pressure on the shaft.

・Check visually the inner surface of the reactor; in need,it can be cleaned with kitchen paper and water.
・Loosen and take off the 3 screws which fix the assembly of wiper plate on the mobile nut.
・Take off the assembly of the wiper plate from the pressure container.



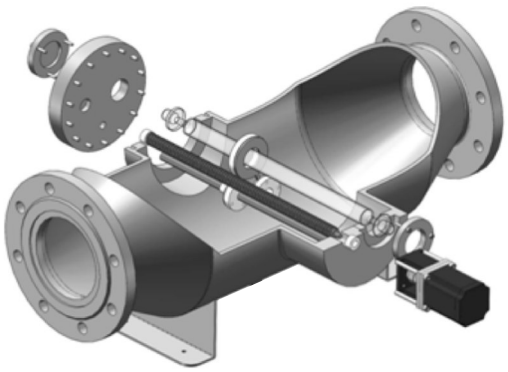
SCREW STEM
WIPER RING
WIPER PLATE ASSEMBLY

THE ULTRAVIOLET REACTOR DISPLAYING THE ASSEMBLY OF WIPER PLATE.

Loosen and take down the 4 screws which fix the plywood to the wiper plate.Take out the wiper ring and change new wiper ring.Re-install the assembly of wiper plate, and check whether the gasket ring can slide freely between the two setting plate.

Information:
Ensure that the direction of installation of the wiper ring is correct. When the wiper ring is installed properly, the gasket ring in the wiper ring can be seen from the wiper plywood.

・Re-install the wiper assembly on the mobile nuts, ensure it is in the correct direction.
・Check whether the assembly of wiper panel is on the correct "parking" position. The wiper ring must be on the end of the thread part of the driving shaft.
・Check the status of gasket ring on the flange plate; in need, it can be changed.
・Re-position the flange plate, ensure that the free end of the driving shaft of the wiper is properly in axle support bearing at the back of the flange plate.



SCREW STEM
SEAL BLOCK OF THE REACTOR
GEAR CASE

THE REACTOR WHICH DISPLAYS THE POSITION OF THE DRIVING SHAFT

・Install all nuts of the flange plate on their original positions and screw them tightly.
・Re-install the quartz tube according to methods described before.
・Re-install the drainage plug on the reactor.
・Install all nuts of the flange plate on their original positions and screw them tightly.
・Re-install the quartz tube according to methods described before.
・Re-install the drainage plug on the reactor.
・Slowly open the isolating valve of water, let the swimming pool water slowly submerge the reactor.
・Check whether there are signs of leakage on the flange plate and quartz tube. If there are, isolate the water, check and re-seal, and in need, change the quartz tube or gasket ring.
・Open the bypass valve or start the main recycling pump, let the water flow into the reactor.

Information:
Depending on the position of the reactor in the system, at the initial several minutes of letting the water flow into the reactor, there may be a small amount of air entering the swimming pool.
・Check the sealing of flange plate and the gasket ring of the quartz tube, ensure whether there are signs of leakage, and let the equipment run for 15 minutes. If the leakage is observed, isolate the water according to the methods described before, check and re-seal, and in need, change the quartz tube or gasket ring.
・After sealing the quartz tube, one should check the interior of the quartz tube, ensure that it is clear and dry. If it is needed, clean and dry it with clean cloth.

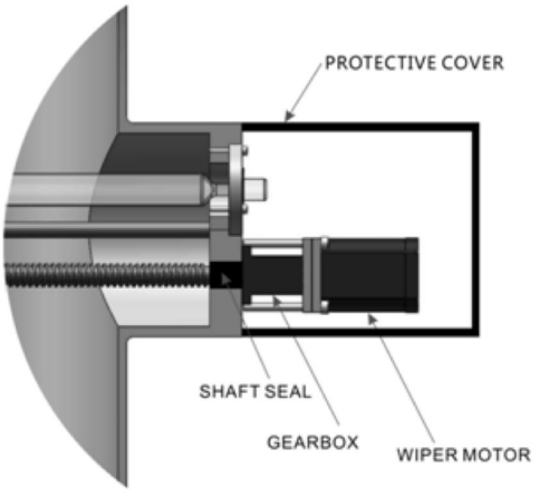
Indication:
The inner surface of the quartz tube and the ultraviolet lamp must be totally dry. If this cannot be ensured, the service life of the lamp will be shortened.
・According to the methods described before, re-insert lamp and lamp base adapter, ensure again that all screws have been re-installed properly.

Information:
Before properly installing the lamp base adapter, never power on the power of the control panel.
Now the equipment can be re-started according to the methods described before.

7.4-Check the Driving Organism of the Wiper

The checking of the wiper's driving organism should be done each year (or in the process of the last changing the ultraviolet lamp) so as to ensure that it can continuously run.
・Check whether the main power of the control panel has been cut off.

Important Indication:
Before cutting off the power, please ensure that the system has completed any automatic wiping of the quartz tube, and the wiper is on park model.



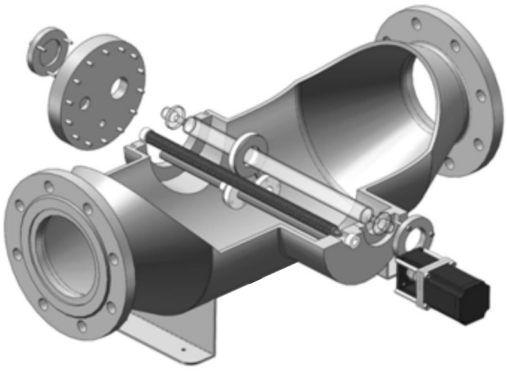
SHAFT SEAL
EVEN THE SHAFT DEVICE
WIPER MOTOR
PROTECTIVE COVER

THE REACTOR WHICH DISPLAYS THE ASSEMBLY OF THE WIPER MOTOR

- Remove the cover plate.
- Check visually whether there is water trance at the point where the shaft of the wiper gets through the plate.
- If there is water trace, it indicates that the shaft seal is watered and should be changed.

Change the shaft seal:

- According to the methods in Section 7.3, dismantle the reactor.
- Remove the 4 screws which fix the shell of the motor of the wiper on the back panel, and then rise it up.
- Unscrew the screws of the drive coupling at the ends of the wiper.
- Remove the motor and the motor base.
- Remove the mechanical sealing ring at the end of the wiper (which is fixed at the front of the connector), and then remove the drive coupling from the open end of the reactor.
- Install the new sealing ring on the flange plate and shaft (the model of the sealing ring: NJK-12).



SCREW STEM
WIPER RING
CIRCLIPS
SHAFT BEARING
SHAFT SEAL

THE FORMING OF WIPER SHAFT/ MOTOR

- Re-assembly in reserve order according to the specifications in Section 7.3

Important Indiation:
When installing the new seal, please note that the surface of carbon is very crisp, the damages to these parts will affect the integrity of sealing.

- Start manual wiping, observe whether the wiper motor can play the correct function.

7.5-Changing Ultraviolet Lamp

Changing the Filter Pad of the Control Panel.Depending on the installing environment of the control panel, the filter pad installed on the air intake fan grid should be cleaned or changed regularly.
It is suggested to check the filter pad each month after the maintenance of the equipment. The according to the result, the times of checking can be reduced to one time per 3 or 6 months.

8.0-Trobleshooting

The troubleshooting can only be implemented by maintainer who have received trainings and who are approved by the owner and/or user of the equipment. The owner and/or user must ensure that the maintainers who have been approved by the owner and/or user to implement this task must be familiar with safety measures and regulations except reading and understanding this operation manual, and must strictly implement these safety measures and regulations.

Warning:
The following steps require to be tested on the electrified lines. These checks can only be done by applicable and qualified engineers who fully understand the electrical circuit as well as voltage.

8.1-Failure Indication – E1 The Temperature of the Reactor is too High

It indicates that:
・The control system records that the temperature of the monitoring point of the reactor and the sensor is higher than the alarming point.
Checking items:
・The temperature and alarming point recorded on the panel.
・The water volume flowing through the pressure container
・The status of running of the temperature sensor
・Whether there is air in the reactor.

8.2-Failure Indication – E2 The Failure of Temperature Sensor

It indicates that:
・There are failures of the temperature sensor.
Checking Items:
・Check whether the connecting line between the sensor and the control box has been cut.
・Check the electric resistance of each line of the sensor, if the resistance is normal, then change the module of the temperature transmitter.

Important Indication:
Disconnect the connection, and check the electric resistance of the sensor. The electric resistance should be a low value.
Terminal TP1and TP2 = 114 ohm
Terminal TP2 and TP3 = 1.2 ohm
Terminal TP2 and TP3 = 1.2 ohm
The control system monitors that the light intensity value within the reactor is below the set alarmed value.

8.3-Failure Indication – E3 The Intensity of Ultraviolet is too Low

It indicates that:
・The control system monitors that the light intensity value within the reactor is below the set alarmed value.
Checking items:
・Whether the operating power of the system is low power.
・Whether the operating timer of the ultraviolet lamp is within valid period.
・Clean quartz casing pipe and the window of the sensor.

Checking Items:
Ultraviolet sensor gives out 0-5V DC voltage signal, which will be input into the controller. Through measuring this signal, it can be judged whether the sensor work properly.

- Power line and connections of the sensor.
- The adapter plug of the sensor (under circumstances of pollution or water leakage).
- Quartz tube of the lamp (under pollution).
- Quartz tube of the ultraviolet lamp reaches the end of its expected life span.
- The changing of the quality of the swimming pool water.
- The ultraviolet lamp reaches the end of its expected life span.
- Whether proper alignment had been done to the sensor when changing the lamp last time.
- The equipment operates with low power due to the failures of ballast resistor or control circuit.

When the system is ready to run again, press the key of re-set and re-set fault indication. Once the fault indication disappears, the equipment can be re-started.

Important Indication:
When the ultraviolet lamp re-starts, , check whether the current is within the limited tolerance.

Information:
When the system starts, considering that there may be high current appearing in the stage of starting, the software will delay 3 minutes before re-checking the current.

8.4-Failure Indication – E4 The Failure of Ultraviolet Light

It indicates that:

- The control system inspects that the ultraviolet lamp cannot be lightened properly.

Checking Items:

- Whether the power supply voltage is within tolerance limit and whether it matches with the voltage marked on the nameplate of the panel.
- Ultraviolet lamp
- Ballast resistor
- Whether the connecting line of the ultraviolet lamp is fixed (if the failures happen after the starting switch has been operated)
- Re-start the ultraviolet lamp so as to prevent failures caused by the overheating of the light tube.

Important Indication:
Check whether the operation value is the same with the measured voltage value.

Information:
Re-start the ultraviolet lamp so as to prevent failures caused by the overheating of the light tube.

8.5-Failure Indication – E5 System Failure

It indicates:

- There are failures of the control system.

Checking Items:

- Whether the power supply voltage is within tolerance limit and whether it matches with the voltage marked on the nameplate of the panel.
- The filtering pad of the air grid
- The status of operation of the cooling fan on the ballast resistor
- The status of operation of the cabinet fan
- The environment temperature of the motor room

Information:
When the system operates again, the trouble spots will be eliminated.

8.6-Failure Indication – E6 Insufficient Supply Voltage

It indicates that:

・The control system records that the supply voltage is below the alarming point set in the system.

Checking Item:

・Whether the power supply voltage is within tolerance limit and whether it matches with the voltage marked on the nameplate of the panel.

・Whether the connection of mains cable is reliable.

Information:

After the system is electrified for the first time, it may trigger the low voltage alarming; the system may inspect the voltage value 3 seconds after the system is electrified.

8.7-Failure Indication – The Failure of Wiping Motor

The alarming signal comes from the driver on the circuit of wiper motor.

It indicates that:

There are failures of the wiper motor.

Checking items:

Whether the shaft of the wiper rotates freely.

When checking it, disconnect the 24V power supply of the motor and rotate the shaft of the wiper manually, so as to rotate the motor of the wiper and the subpanel. The shaft should rotate freely in both two directions.

After checking it, make sure to recover the shaft to its starting location.

If the shaft cannot rotate freely in both directions, the internal assembly should be dismantled so as to check the moving nut.

The motor of the wiper.

When checking it, remove the motor of the wiper from the pressure container. After separating from the wiper shaft, start the mode of manual wiping. The wiper motor should move in the sequence of forward/backward, and then pause. The whole process will last 2 minutes.

If the wiper doesn't operate, check the voltage that connects the motor. The voltage will be 24VDC.

Information:

This failure cannot switch off the ultraviolet lamp.

When exiting the failure screen, the failure will be re-set.

If the failure appears when doing one of the wiping operation, the controller may record the point where the failure appears; after the power supply being switched on again, the sequence of pausing will be started.

If the wiper testing is done after being removed from the wiper shaft, then before re-installing the wiper motor, the motor and the wiper shaft should be re-set to the location of starting.

When this alarming is given out, the working hours of the lamp, which displayed on the working hour screen, should be at least 5000 hours. It indicates that preparations should be made to change the lamp, and the indication appears every 1000 hours.

8.8-Warning Indication – The Lamp Needed to be Changed

It indicates that:

・The control system records that the ultraviolet lamp is at the end of the expected service life.

Checking Items:

・Change the ultraviolet lamp.

・Re-set the hour counter of the lamp.

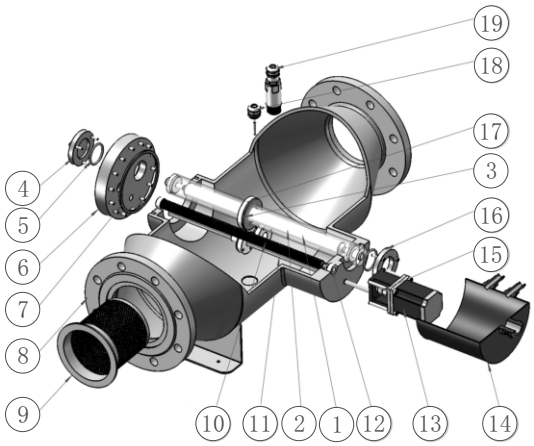
Information:

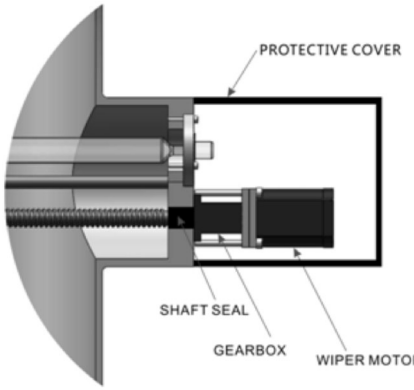
When this alarming is given out, the working hours of the lamp, which displayed on the working hour screen, should be at least 5000 hours. It indicates that preparations should be made to change the lamp, and the indication appears every 1000 hours.

Information:

When the alarming of changing the lamp lightens, it means that the lamp has reached the end of the expected life span, which is 8000 hours. But it doesn't mean that the lamp will never work.

9.0-Spare Parts





SHAFT SEAL
EVEN THE SHAFT DEVICE
WIPER MOTOR
PROTECTIVE COVER

THE REACTOR WHICH DISPLAYS THE ASSEMBLY OF THE WIPER MOTOR

Spare Parts of the Model NT-MPUV 40 / 60 / 105	
Number	Name of the Spare Par
01	Quartz lamp 1-2KW
02	Quartz lamp tube 40 x 420
03	Mobile nut bracket

Spare Parts of the Model NT-MPUV 145 / 170 / 300	
Number	Name of the Spare Par
01	Quartz lamp 2.5-7KW
02	Quartz lamp tube 40 x 580
03	Mobile nut bracket

Spare Parts of the Model NT-MPUV 220	
Number	Name of the Spare Par
01	Quartz lamp 4KW
02	Quartz lamp tube 40 x 420
03	Mobile nut bracket

Spare Parts of the Model NT-MPUV 355 / 415	
Number	Name of the Spare Par
01	Quartz lamp 3-3.5KW
02	Quartz lamp tube 44 x 580
03	Mobile nut bracket

Standard Spare Parts of Various Models	
Number	Name of the Spare Par
04	Quartz tube fixing ring 1
05	Quartz tube gasket ring
06	Seal block of the reactor
07	The rubber ring of the main body of the reactor
08	Main body of the reactor
09	Filtration Basket
10	Screw stem
11	Reaction member
12	Shaft seal
13	Engine
14	Protective cover
15	Gear case
16	Quartz tube fixing ring 2
17	Wiper ring
18	Temperature sensor
19	Sensor of the intensity of light

9.1-Spare Parts of Control Panel

The details of all spare parts of the electrical control panel are contained on the Schematic Diagram.

10.0-Warranty

Ultraviolet equipment (ultraviolet reactor and electrical control panel) enjoys limited warranty period within 12 months from the date of purchasing, during this period, equipment failure caused by the defects in technologies or spare parts will be corrected, if the following steps have been done:

1.Within 12 months since the registered date of purchasing, send the notification of failure declaration to EMAUX Company.

2.After the notification has been given, please pack the spare parts or attachments properly, return them to the address named by EMAUX Company, and pay all the transportation fee and any other cost.

3.After checking, EMAUX Company confirms that the stated defects can trace back to original parts or technologies. Under the following conditions, the warranty is invalid: if the maintenance of the equipment is done by other personnel rather than the maintenance engineer who have been trained and whose employment has approved by the supplier; or the equipment has not been installed or operated according to the instructions in this manual.

In any circumstance, EMAUX Company is free from undertaking any indirect losses, damages or costs caused by the supplying and using of the equipment, no matter it is alone or combined with other equipment.

EMAUX medium-pressure ultraviolet lamp has total replacement supporting of maximum 2000 operating hours. Clients should use the ultraviolet lamp by the specified ways which are specially designed for it. Also, clients should return the ultraviolet lamp according to the above mentioned content, so as to make the trust decision of changing the ultraviolet lamp.

11.0-Waste Disposal

Waste disposal of the following materials composing the spare parts of UVARAY equipment. Such as:

- Electronic printed circuit board
- Power resistor
- Silicon rectifier
- Capacitor
- Plastics such as PTFE, PVDF, PE, PVC, plexiglass (pipes,conduit, cable channels, electronic components)
- Non-ferrous metal such as nickle, brass, copper (connectors, tracks, cables)
- Stainless steel materials etc.
- The ultraviolet lamp with glass and small amount of mercury

Waste disposal should be done by professionals from the owner's company or special processing company.

12.0-Compliance with CE

CERTIFICATION OF COMPLIANCE

According to machinery directives of CE standard 2006/42/EC EMC 2004/108/EC

Type of the Equipment

Commodity: Medium-pressure ultraviolet Type: NT-MPUV

The above mentioned equipment is developed, designed and manufactured by the following company according to the mentioned EU standards:

Company: EMAUX Company Limted, Langlands Place, East Kilbride, Scotland, G75 0YF

The following coordination standards have been applied:

Safety of Machinery; Part 1 and 2

Safety of Machinery -- Electrical equipment of the machine; Part 1 The insulation coordination of the equipment in the low pressure system

Industrial, scientific and medical equipment; radio interference characteristics. Limits and methods of measurement.

Electromagnetic compatibility. Common criteria. Immunity of industrial environment.

Electromagnetic compatibility. Common criteria. Emission standard of the industrial environment.

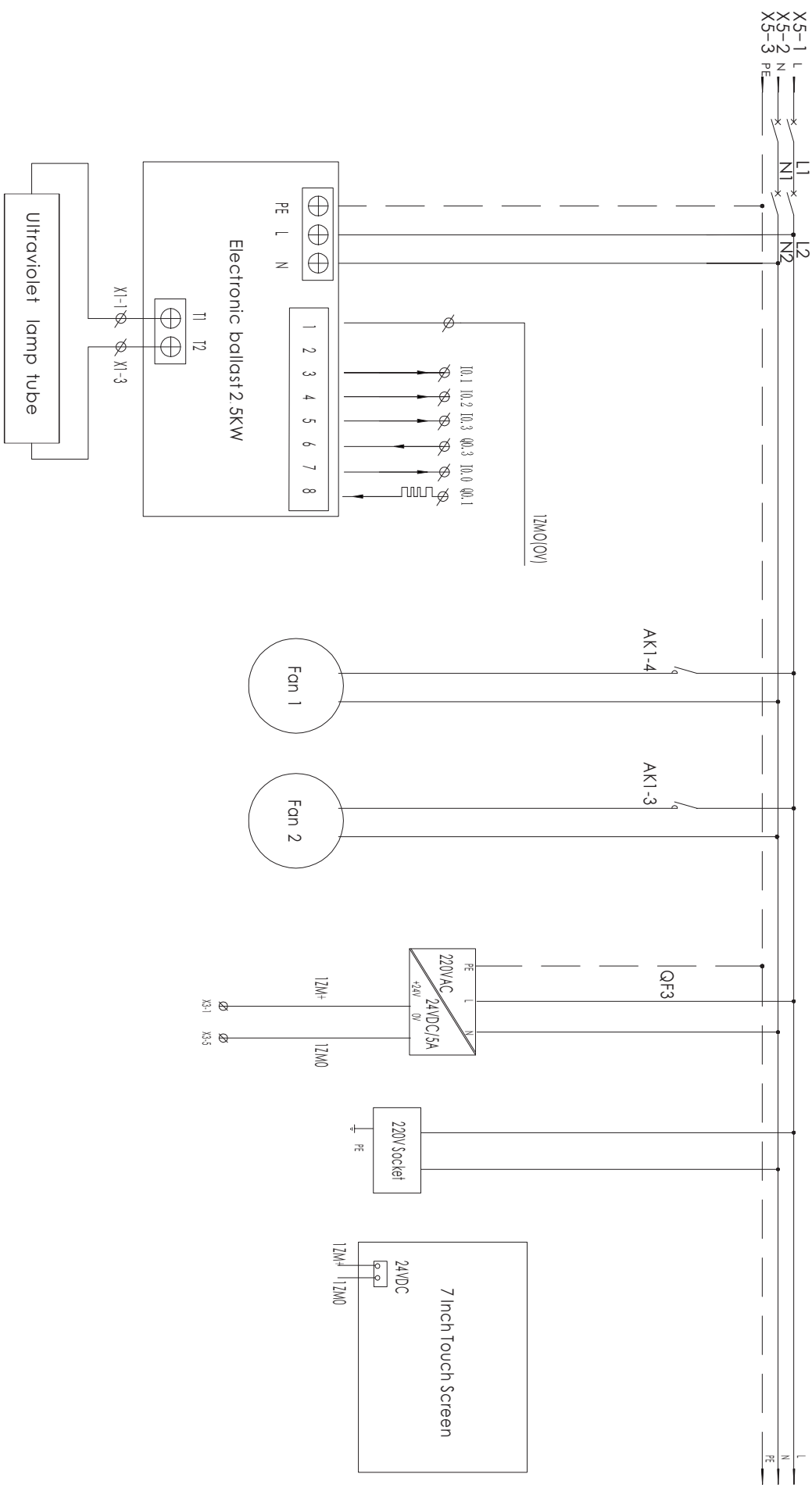
Electromagnetic compatibility. Test and measurement technologies. Test on electrostatic discharge immunity.

Electromagnetic compatibility. Test and measurement technologies. Test on electrical fast transient/pulse group immunity.

13.0-Compliance with NSF50

All NT-MPUV equipment gets NSF Standard 50 Certificate.
NSF50 Standard specifies that the purpose of ultraviolet equipment is to be as a supplemental dealing to the recycling system of public and residential swimming pool. Because ultraviolet equipment cannot produce disinfection residue in swimming pools, these products should be used together with EPA registered chemical disinfection of applicable doze. An authoritative regulator may require to provide the detailed residue of EPA registered chemical disinfection. The amount of residual chemicals can be measured simply and correctly by the field test equipment.

14.0-Schematic Diagram



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